National Library of Canada
Canadian Theses Service
Ottawa, Canada
K1A 0N4

Bibliothèque nationale du Canada
Services des thèses canadiennes

## CANADIAN THESES

## THÈSES CANADIENNES

### NOTICE

The quality of this microfiche is heavily dependent upon the quality of the original thesis submitted for microfilming. Every effort has been made to ensure the highest quality of reproduction possible.

If pages are missing, contact the university which granted the degree.

Some pages may have indistinct print especially if the original pages were typed with a poor typewriter ribbon or if the university sent us an inferior photocopy.

Previously copyrighted materials (journal articles, published tests, etc.) are not filmed.

Reproduction in full or in part of this film is governed by the Canadian Copyright Act, R.S.C. 1970, c. C-30.

### AVIS

La qualité de cette microfiche dépend grandement de la qualité de la thèse soumise au microfilmage. Nous avons tout fait pour assurer une qualité supérieure de reproduction.

S'il manque des pages, veuillez communiquer avec l'université qui a conféré le grade.

La qualité d'impression de certaines pages peut laisser à désirer, surtout si les pages originales ont été dactylographiées à l'aide d'un ruban usé ou si l'université nous a fait parvenir une photocopie de qualité inférieure.

Les documents qui font déjà l'objet d'un droit d'auteur (articles de revue, examens publiés, etc.) ne sont pas microfilmés.

La reproduction, même partielle, de ce microfilm est soumise à la Loi canadienne sur le droit d'auteur, SRC 1970, c. C-30.

**THIS DISSERTATION HAS BEEN MICROFILMED EXACTLY AS RECEIVED**

**LA THÈSE A ÉTÉ MICROFILMÉE TELLE QUE NOUS L'AVONS REÇUE**

NL-339 (r.86/06)

Canada

THE UNIVERSITY OF ALBERTA

# THE ROLE OF DEPRESSION IN THE REHABILITATION OF INDUSTRIALLY INJURED ADULTS

BY

LES BLOCK

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF EDUCATION IN COUNSELLING PSYCHOLOGY

DEPARMENT OF EDUCATIONAL PSYCHOLOGY

EDMONTON, ALBERTA

© SPRING, 1987

Permission has been granted to the National Library of Canada to microfilm this thesis and to lend or sell copies of the film.

The author (copyright owner) has reserved other publication rights, and neither the thesis nor extensive extracts from it may be printed or otherwise reproduced without his/her written permission.

L'autorisation a été accordée à la Bibliothèque nationale du Canada de microfilmer cette thèse et de prêter ou de vendre des exemplaires du film.

L'auteur (titulaire du droit d'auteur) se réserve les autres droits de publication; ni la thèse ni de longs extraits de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation écrite.

ISBN 0-315-37808-5

THE UNIVERSITY OF ALBERTA

RELEASE FORM

NAME OF AUTHOR: LES B. BLOCK

TITLE OF THESIS: "THE ROLE OF DEPRESSION IN THE REHABILITATION OF INDUSTRIALLY INJURED ADULTS"

DEGREE: MASTER OF EDUCATION

YEAR THIS DEGREE GRANTED: 1987

Permission is hereby granted to THE UNIVERSITY OF ALBERTA LIBRARY to reproduce single copies for private, scholoary or scientific research purposes only.

The author reserves other publication rights, and neither the thesis no extensive extracts from it may be printed or otherwise reproduced without the author's written permission.

L. Block

(Student's Signature)

9811 - 161 St Edmonton

(Student's Permanent Address)

Date: April 16, 1987

THE UNIVERSITY OF ALBERTA

FACULTY OF GRADUATE STUDIES AND RESEARCH

The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled "The Role of Depression in the Rehabilitation of Industrially-Injured Adults", submitted by Les B. Block in partial fulfillment of the requirements for the degree of Master of Education.

(Co-Supervisor)

(Co-Supervisor)

Date: April 13/1987

## ABSTRACT

The sample consisted of 55 male and female workers was stratified to reflect the proportion of workers who received help from psychologists, vocational rehabilitation counsellors, or neither. All subjects were selected from the population at the Rehabilitation Centre, Workers' Compensation Board, Alberta.

55 male and female subjects were administered the Beck Depression Inventory (short-form) to determine degree of depression. A demographic data sheet was completed on all subjects. Statistical tests of significance were then applied to determine differences on B.D.I. scores for the following independent variables: sex, marital status, union affiliation, belief that a job would be available upon discharge, and discharge category. Correlation coefficients were calculated to determine relationship between B.D.I. scores and age, education, salary, time spent in Rehabilitation Centre, and time between occurrence of accident and admission to Centre.

There was a difference between discharge groups and level of depression. Discharge groups were: fit for regular work; fit for modified work; unfit for work. The difference existed between the group consisting of those unfit for work and those fit for modified work. It was also discovered that the longer the wait from date of accident to admission into the Centre, the more depressed the workers were. The hypotheses that were not supported have also been discussed.

## ACKNOWLEDGEMENTS

This thesis has been dedicated to the Workers' Compensation Board of Alberta who permitted the study, encouraged and supported me throughout the course of this study.

Special thanks to Dr. Jim Vargo who provided valuable assistance and encouragement. I would also like to thank Dr. Gene Fox, Dr. Bill Hague, and Mrs. Sharon Brintnell who served as other members of the committee. Dr. Jim Evans from the Workers' Compensation Board was also helpful throughout the study.

Finally, to my family, Enrica, Barbara and Sera whose love, patience and encouragement have made this all possible, a special thank you.

## TABLE OF CONTENTS


| CHAPTER | | PAGE |
|---|---|---|
| I | INTRODUCTION | 1 |
| | The Nature of the Problem | 1 |
| II | REVIEW OF RELATED LITERATURE | 4 |
| | The Nature of Depression | 4 |
| | Cognitive Theory | 7 |
| | Chronic Pain | 9 |
| | Psychosocial Factors | 12 |
| | Depression and Pain | 13 |
| | Summary | 18 |
| | Hypotheses | 21 |
| III | METHODOLOGY | 23 |
| | Sample and Population | 23 |
| | Procedure | 24 |
| | Instrumentation | 26 |
| IV | RESULTS | 29 |
| V | DISCUSSION, IMPLICATIONS, LIMITATIONS | 36 |
| REFERENCES | | 48 |
| APPENDIX | 1. Consent Form | 55 |
| APPENDIX | 2. Demographic Data Sheet | 56 |
| APPENDIX | 3. Beck Depression Inventory | 57 |
| APPENDIX | 4. Distribution of BDI Scores vii | 58 |

# CHAPTER I

# INTRODUCTION

## Nature of the Problem

Clinical depression is the most prevalent psychiatric disorder in people outside of mental institutions (Kline, 1967; Kaplan & Sadock, 1985; Hare, 1985). It is estimated that between 6% and 36% of our population suffer from frequent depressed mood, irrespective of psychiatric diagnosis (Neilson & Williams, 1980), with depression occurring in disproportionate frequency among patients with chronic pain or chronic illness (Schaffer, Donion, & Bittle, 1980; Rutter 1977; Elton, Stanley, & Burrowes,1978). Under certain circumstances people who are receiving compensation for an injury will have a disproportionate disability and delayed recovery in part due to depression (Tullis & Derebery 1983).

With an estimated two billion dollars paid in benefits for 1982 in Canadian Workers' Compensation Boards of Canada (Harding, 1984), it has become essential to investigate the role of depression in the rehabilitation of industrially-injured adults. Although other factors such as escape from responsibility, revenge, and other psychiatric problems (Tullis & Derebery, 1983; Harsha, 1982; Weddington, 1983) also contribute to delays in recovery, depression was chosen as the unit of study because it can be readily identified and treated.

The purpose of the present study was to examine depression and determine its impact on the rehabilitation of a sample of

industrially-injured adults. This sample was selected from the general population of the Workers' Compensation Board of Alberta Rehabilitation Centre. Patients of the Centre are generally considered to be suffering from chronic pain, secondary to their industrial injury.

The focus of the research was to address the following questions:

a) Did males differ from females on Beck Depression Inventory (BDI) scores?

b) Was there a relationship between B.D.I. scores and age?

c) Was there a difference on B.D.I. scores according to marital status?

d) Was there a relationship between B.D.I. scores and level of education?

e) Was there a difference on B.D.I. scores according to union affiliations?

f) Was there a relationship between B.D.I. scores and money earned?

g) Was there a difference on B.D.I. scores and belief that a job is or is not available?

h) Was there a relationship between B.D.I. scores and length of time at the Centre?

i) Was there a difference between B.D.I. scores and discharge status?

j) Was there a difference between B.D.I. scores and length of time between occurrence of accident and admission to the Centre?

For the effective management of chronic illness, a thorough understanding of the nature and manifestations of depression was required. Chronic pain is frequently accompanied by depression. This afforded the opportunity to view the relationship between chronic pain and depression, although the focus of this study is on depresssion. Although no attempts were made to measure pain, a review of the literature on pain puts this study in perspective.

## CHAPTER II

## REVIEW OF RELATED LITERATURE

This literature review has been divided into the following areas: clinical depression; chronic pain; interaction between pain and depression.

### The Nature of Depression

The study of depression encompasses a diverse array of approaches including biochemical, physiological, psychodynamic, cognitive, and disease-model. Consequently, consensus on the topic does not exist; instead, an eclectic, often contradictory picture emerges. Generations of thought dating back to Hippocrates have addressed the phenomenon of depression or "melancholia", yet no definitive clinical picture has emerged. At best, there exists a composite model which reflects the multidisciplinary contribution.

The Diagnostic and Statistical Manual of Mental Disorders (3rd ed.) Training Guide (Webb, Diclemente, Johnstone, Sanders & Perley, 1981) provides an overview of affective disorders:

> All of the disorders in this classification have, as a common denominator, a primary and preponderant disturbance in mood. Mood is a prolonged and pervasive emotional state that affects the total person: feelings, outlook, attitude, self regard, activity level, homeostatic balance, and trends in thinking (p. 82).

The D.S.M. III (American Psychiatric Association, 1980) and the D.S.M. III Training Guide (Webb, et al, 1981) contain comprehensive descriptions of affective disorders.

Freidman (1974) defined depression in three ways: as an affect, as a clinical state, and as a character style. Depression as an affect is the basic feeling of "sadness" which is "part of the fabric of life and which is noted in states of grief and periods of disappointment (P. 283)." Clinical states involve a complex of symptoms, including the affect as well as motivational, vegetative, and cognitive disturbances.

Schmale (1972) summarized the depressive character as:

> . . . personality features which provide some protection against the frequent re-experiencing of either the feelings of helplessness or hopelessness (P. 286)."

The basic premorbid personality pre-disposing individuals to clinical depressive episodes involves what Schmale (1972) has labelled "masochistic", "obsessive", "pseudo-independent" types. People described as "sticky", "demanding", and "pessimistic" fit this depression character description (Schmale, 1972).

Where Freidman hypothesized that the affect of depression is a "biologically rooted" response to stress, Klerman (1971) concluded that the clinical state of depression represents the failure of adaptation.

The biogenic amine hypothesis holds that depression occurs with low levels of amines in the brain and mania with high levels. Davis (1970) summarized this hypothesis:

> Since depression and mania are disease states characterized by alterations in affect and drive and associated with marked sleep disturbances, and

> since amines are localized and appear to function in brain areas related to drive, emotions, and sleep, additional supportive evidence is provided for the hypothesis that a relationship does exist between amines and these two disease states. (P. 149).

Differential emotion theory of depression declares depression to be a variable pattern or combination of discrete but interacting fundamental emotions and feelings, each of which may have different neural and biochemical substrates (Izard, 1972). It follows that depression involves a variable pattern of emotion-related neural and biochemical mechanisms on the one hand, and a variable pattern of emotions, feelings, and emotion-related attitudes on the other (Izard, 1972).

Freud (1968) considered distress (sadness and dejection) a prominent factor in depression. He thought that the loss of self esteem was the trigger for the inner-directed hostility that finds "utterances in self-reproaches and self revilings, and culminates in delusional expectations of punishment" (p. 51).

Freud (1968) saw hostility or inner-directed anger as having an important role in depression, but guilt or "dissatisfaction with the ego on moral grounds" (p. 72) as the most outstanding features in the clinical picture of depression.

Kraines (1957) developed a biogenetic theory of depression in which he described the etiology as being essentially physiological

- hereditary and hormonal influences. It has been well documented in twin studies (Hurst, 1969) that if one member of monozygotic twins has manic depressive psychosis, between 70 - 96% of the other members will suffer the same disorder. Kraines has also examined post-partum depression on normally stable women, the efficacy of ECT and other radical treatments, and so on, which support the biogenetic-hereditary model of depression.

**Cognitive Theory**

Beck (1967) assumed that cognition is the principal determinant of emotion, mood and behavior. The three major cognitive patterns in depression include: the individual's way of viewing himself, his world, and his future. The depressive exhibits depressed mood, paralysis of will, suicidal wishes, and increased dependency. Negative self-concept is associated with self rejection and self dislike.

Burns and Beck (1971) noted that for every dysphoric emotional state there is a corresponding mental set that consists of the ideas and beliefs occurring at the time the negative affect is experienced. "Such cognitions in depressed patients tend to revolve around such themes as worthlessness, hopelessness, and suicide" (p. 110). Negative beliefs and feelings as well as disturbed bodily functions and maladaptive behaviors continue to reinforce one another, and lead one to believe that life is empty and useless.

Beck (1967) described depression by the following paradoxes: a depressed person's image of himself frequently does not fit the objective facts; objective evidence or logic has little effect

on the depressive's misconception of himself; behavior is often apparently in conflict with the pleasure principle; psychogenic determinants seem evident in some cases and not in others.

Emotionally, depression includes dejected mood and loss of caring. Cognitive manifestations include low self evaluation, and increases in self-blame and self-critism. Motivational manifestations are regressive in nature, with a preference for dependency. Physically, there is also often a loss of appetite, sleep disturbance, and loss of libido.

Beck and Beck (1972) described depression as the precipitating factor of physical injury. The diagnosis of depression is often masked by a wide variety of physical symptoms. This has obvious complicating implications for a person recovering from an industrial injury in the rehabilitation process. Depression often masquerades as somatic disorder and as people tend to conceal mood deviations, diagnosis is often missed (Beck & Beck, 1972). Tullis and Derebery (1983) added that the depressed person is more likely to suffer an injury at work because of psychomotor retardation, self destructive tendencies and inattention to external stimuli.

The affective state of depression is similar to sadness but is longer lasting and more pervasive. In some cases, irritability and loss of interest may be the predominant characteristics. Changes in the cognitive sphere are present, giving patients a tendency towards idiosyncratic interpretations of themselves and their experiences (Kovacs & Beck, 1978). They tend, for example, to consider themselves inadequate, undesirable and defective and to attribute unpleasant experiences to physical or psychic

defects. A number of typical somatic symptoms are also present, including poor appetite, weight change, insomnia, hypersomnia, psychomotor agitation or retardation, decreased energy and libido, decreased ability to think or concentrate, constipation and headaches.

**Chronic Pain As A Somatic Symptom**

Although the literature on chronic pain has recently begun to burgeon, the medical model is still not adequately prepared to deal with such a phenomenon. Until recently, pain has been classified as either organic or psychogenic; such reasoning has done little to come to terms with this prevalent problem.

Chronic pain syndrome must be considered as a psychologic - physiologic disability (Addison, 1984; Loeser & Black, 1975; Fordyce, 1976). Typically, such people do not respond to a host of medical treatment modalities. The person with chronic pain frequently relinquishes responsibility. Over time, patterns of behavior established as a response to chronic pain syndrome become firmly ingrained (Addison, 1984; Fordyce, 1976). The longer a patient is disabled, the less likely he is to return to a normal level of activity.

Chronic pain is of long duration and is usually not relieved by a single treatment modality. Chronic pain syndrome can be described as consistent, constant pain, usually referable to an organ system but seldom resulting in a definitive, treatable diagnosis (Addison, 1984). The clinical aspects of chronic pain syndrome are, according to Addison (1984), as follows:

1. the pain rarely serves a biological function.
2. psychologic and environmental factors lead to the development of "chronic pain behaviors".

3. the mechanisms and pathophysiology of the pain are obscure, rendering the classic medical treatment model inappropriate.
4. physical findings are usually inconclusive and considered non-organic.

"Suffering" becomes an important characteristics of chronic pain syndrome (Loeser & Black, 1975; Pilowsky & Bassett, 1982). This "suffering" leads to the exhibition of pain behaviors, such as, abnormal physical positioning, talking about pain, multiple physician visits, increased anxiety, unemployment, excessive bed rest, limping, wincing, and crying. Once established, these pain behaviors are reinforced by psychosocial problems. Many other stressors including vocational, marital, and financial problems may overwhelm the person (Fordyce 1976; Addison, 1984).

**Psychosocial Factors**

An overwhelming sense of helplessness pervades the lives of people experiencing chronic pain. They see themselves as being out of control and, therefore, will relinquish both short-term and long range planning. They become preoccupied with their pain - they become angry with the medical world, they lose friends, and their families will take care of them at first, but only reluctantly as time passes. Family problems often erupt. People begin avoiding contact with their employers. "Over time, pain becomes a central component of their psychosocial stability, and the possibility of being pain free carries with it the risk of psychologic destabilization. (Lawlis & McCoy, 1983, p. 529)."

Learned pain can be detected in chronic pain sufferers by the presence of five well-defined groups of symptoms as described by Brena and Chapman (1981): dramatization, drug abuse, dysfunction, dependence and disability.

Dramatization is characterized by pain complaints with an emotional impact. The drug abuse group of symptoms is characterized by the chronic pain patient's tendency to abuse habit forming drugs to gain relief from pain. Dysfunction is characterized by bodily impairments related to physical and emotional factors. This is accompanied by poor motor coordination, and/or musculo-skeletal impairments caused by misuse of braces, collars and other ambulation devices. A decrease in sexual libido is also reported as characteristic of this group. The dependency group is manifested by feelings of helplessness, passivity, depression, and loss of self-reliance. Disability group plays an important role in conditioning patients responding to treatment and may actually deter injured workers from returning to normal activities and gainful employment. Disability benefits, pending litigation, and the possibility of early retirement can be strong pain reinforces (Brena & Chapman, 1981; Hirshfeld & Behan, 1963).

Jacobs (1983) identified themes which surface from pain patients in group therapy. The theme that no one really believes they are suffering from pain often surfaces. Anger is expressed towards feelings of dependency. Many patients ask "why me?" or "what did I do to deserve this pain?"

Jacobs (1983) related Kubler-Ross's schema of the dying patient to the patient with chronic pain. The schema includes

denial, anger, bargaining, depression, and acceptance. Many chronic pain patients tend to deny they have suffered a disability, especially during the course of treatment. Some will attempt to engage in previous activities, aggravating their condition (Jacobs, 1983).

Chronic pain patients exhibit a great deal of hostility, anger, and resentment toward family, friends, physicians and staff at treatment centres. The patient attempts to bargain with family and physicians to get them to understand the magnitude of their pain (Jacobs, 1983). Depression surfaces when the patient realizes he cannot perform at the same level as he did prior to his injury (Jacobs, 1983; Rader & Haber, 1984). When chronic pain patients are able to work through the first 4 stages - denial, anger, bargaining, depression they are more able to come to terms with their pain and move on with their lives despite limitations and restrictions from the disability.

Family reorganization, fear of job loss or reduction in earning power are common sequalae to a diagnosis of chronic illness (Moos, 1977). The persistent symptoms of the illness itself provide another source of stress by interfering with the ability to continue daily activities as accustomed (Lambert & Lambert, 1979).

The attendant implications of chronic illness may prompt a depressive reaction; there is a great deal to understand about depression as it occurs in chronic illness. When depression manifests itself in association with a chronic illness, effective treatment becomes even more complicated.

## Depression and Pain

There is evidence that there is a correlation between pain and depression (Ward, Bloom, & Fridel, 1979; Rodin & Voshart, 1986). The association of depressive illness and chronic pain has been recognized for some time (Sternbach, 1974), but the exact nature of this association remains unclear.

Depression, which is found as a loss of interest and frequently is described in part as lack of motivation on the patient's part, occurs when anger is repressed (Harsha 1982). Depression lowers pain tolerance more effectively then any other factor, increasing the patient's perception of pain. The doctor may now become confused and often angry because the patient's complaints of pain far outweigh his organic findings. The depression may deepen even to the point of suicidal ideation.

Some depressions can manifest themselves in an easily recognizable way. However, clinical experience has shown that, alongside the basic picture already described, there are other depressions in which the typical depressive symptoms are replaced by other symptomatic equivalents such as somatizing. There is an increase in awareness of somatic complaints as part of depression.

Depression has been observed to reveal itself with somatic symptoms. All forms of depression involve symptomatic participation at the somatic level. Kielholz (1972) and Weddington (1983) emphasized the progressive tendency of depression towards expression at the somatic level.

In depressive equivalents with somatic symptoms, the degree of dissociation between psychic and physical symptoms is extreme in a sense that affect is depressed only slightly, if at all. (Magni & de Bertolini, 1983). The depression manifests itself almost entirely in terms of somatic disturbances. Chronic pain as a depressive equivalent is a state caused by depression manifesting itself almost entirely in this somatic form, making diagnosis difficult (Magni & de Bertolini, 1983).

Headache and sciatic, lumbar, dental, and perianal pain are particularly frequent as depressive equivalents (Lopez, 1972; Bradley, 1963; Magni & de Bertolini, 1982). When a disturbance is apparently, but not really, physical, a considerable period of time usually elapses between onset of symptoms and diagnosis. The main problem is in recognizing depression when the patient does not demonstrate or report alterations in affect. Given the presence of chronic pain and the absence of an underlying organic disease that might justify it, the possibility of a depressive equivalent should be considered. It has not yet been ascertained whether major depression and depressive equivalents represent different expressions of the same disturbance (Magni & de Bertolini, 1983).

Strain (1978) concluded that all chronically ill patients at some point in their illness invariably manifest one or several symptoms of a depressive reaction (see also Weddington, 1983; Addison, 1984). Schwab, Bialou, Holzer, Brown, and Stevenson (1967) noted that patients with medical disorders may have a

depression secondary to the impact of the disability on the person. That is, a physical illness may precipitate a psychiatric disorder, particularly depression (Hirschfeld et al, 1963; Rader et al 1984). Studies of events precipitating or relating to the onset of severe depression have shown that physical illness are the fifth most common antecedents of depression (Leff, Roatch & Bunrey, 1970; Paykel, Myers, Dienelt, Klerman, Lindenthal & Pepper, 1969).

In addition to pain complaints, patients with a primary affective disorder of depression present with the following:

1. Dysphoric mood manifested by feelings of depression, sadness, hopelessness, worry and lack of interest or pleasure; and
2. at least four of the following: appetite change; sleep disturbance, usually insomnia; psychomotor agitation or retardation; loss of interest or pleasure in sex; loss of energy; feelings of worthlessness with guilt; diminished concentration; and recurrent thoughts of death or suicide (Weddington, 1983; American Psychiatric Association 1980). These symptoms are present for at least two weeks with no pre-existing psychiatric disorder, including uncomplicated bereavement and no incapacitating medical disease (Weddington, 1983; American Psychiatric Association, 1980). Depressive symptoms that occur after the onset of chronic pain are considered secondary to the pain, although the secondary affective disorder will usually be accompanied by increased pain symptoms or a change in the patient's behaviour (Weddington, 1983).

Many depressives complain of somatic disturbances involving almost every organ in the body. Gastrointestinal disturbances, backache, headache, and urinary difficulties are common (Sederer, 1983; Rader, et al, 1984; Weddington, 1983). Depression may precipitate or aggravate physical disorders. Depressives often have complicated recovery patterns due to the confounding nature of depression related to their presenting problems.

Investigators using the Minnesota Multiphasic Personality Inventory (MMPI) (Beals & Hickman, 1972; Dahlstrom, Welsh & Dahlstrom, 1972) have found clinically significant elevations on scales designed to assess pre-occupation with somatic problems, depression, and somatization as defence mechanisms in groups of individuals receiving Workers' Compensation. A relationship has been revealed between severity of emotional distress and time lapsed since injury. (Beals & Hickman 1972; Dahlstrom, et al, 1972). Delay in return to work has been associated with increased somatization and depressive symptomatology as well as with a decline in overall morale and a constricted lifestyle (Phillips, 1964).

Depression and anxiety were often present in the subjects studied in the above studies. The elevated "neurotic triad" (Scales Hysteria, Depression, and Hypochondria) were present. Individuals with this type of profile often demonstrate somatic over-concern manifested as hypersensitivity to minor physical dysfunction and in numerous complaints often without adequate physical pathology (Rader & Haber, 1984). Personality testing

suggested that the workers in these studies did not adjust well to their injury or disability.

A person's emotional well being and pre-morbid personality will greatly influence the response to trauma (Tullis & Derebery 1983; Hirshfeld, et al, 1963). A person with an underlying depression will very likely have a delayed recovery from an injury (Hirschfield & Behan, 1963; Enelow, 1968). It is therefore important to identify the depression and treat it concurrently.

Hendler, Vierstein and Shallenberger (1981) have divided chronic pain patients into four categories: objective pain patients, undetermined pain patients, and exaggerated pain patients, associative pain patients. Although all groups exhibit either secondary or primary depression, the fourth group, associative pain patients, relates to this paper. This group consists of those who have psychoses, post-traumatic neuroses, depressive equivalents, malingering, or similar disorders and for whose pain symptoms no organic cause can be found.

Pain may be triggered in part by anxiety, depression, and emotional factors induced by stress; pain may, in turn, produce long term emotional changes in people and their families (Goldberg, 1982). This will likely have implications in people's responses to rehabilitation. Clark and Sparks (1981) alluded to the work of Finneson (1973) who found anxiety and depression were common reactions to people and their families to chronic pain. This seems especially evident when the experience of pain prevented the person from working. As people become accustomed to chronic

pain, they constantly fear its recurrence (Goldberg, 1982).

Maurice - Williams (1981) describes various forms of "psychological overlay" including "reactive depression":

> Reactive depression is quite common among the industrially disabled and may serve to amplify minimal organic pathology. Chronic depression is believed by some to be a major cause of chronic pain and other somatic symptoms (P. 176).

Gottlieb (1979) summarized several studies of patients with low back pain, a common disability among the industrially disabled (Yu, Lewis & Wise 1984). Gottlieb found that patients with intractable emotional problems spent most of their time in the invalid role. Paradoxically, work does not increase pain - the stated reason why many patients do not work - but decreases subjective suffering. Work provides a focus for patient's anxieties, which in turn interrupts the cycle of pain, depression, anxiety, and more pain.

Pilowsky, Chapman and Bonica (1977) examined the incidence and characteristics of depression as part of a study of depression and illness behavior in pain clinic patients. They found that ten per cent of patients could be classified as having a depressive syndrome, with depression scores in the mild to moderate range and an equal distribution of depressed patients between the endogenous and non-endogenous depressive syndrome.

**Summary**

Depression has been recorded since antiquity (Kaplan & Sadock, 1985). Confusion exists in the subclassifications of depression; thus, for the purpose of this study, reactive, psychotic, and endogenous descriptions will not be used per se. All depressions

will be measured through the Beck Depression Inventory without discrimination. The various subclassifications, however, are acknowledged.

It is important to recognize the fact that depressed persons view the self, the world, and the future negatively and that a theme of loss permeates their cognitive distortions (Sacco & Beck, 1985). These cognitive propensities likely play a central role in the development and maintenance of depression. The chronic pain which results from industrial injuries is heightened by the depression as frequently the subject has an increased awareness of his physical woes. Somatization becomes the factor of the depression.

Recognition of depression is the primary task of this study. Masked depression is particularly noteworthy with this population as workers often do not complain of feeling down or sad but have sufficient ancillary depressive symptoms (sleep disturbance, weakness, pain, appetite change, decreased interest, and the like) to suggest the presence of depression (Kathol, 1985).

Medical disability is a stressor for the development of depression. It causes subjects to lose control over their ability to associate with certain people, to do certain tasks, and to go certain places. This loss of control leads to anger and frustration at the situation, the cause of the disability, the doctor, and the self. The frustration is often expressed by demonstrating dysphoria (Kathol, 1985).

The purpose of this literature reivew was to capture some

of the salient features of depression, which is central to this study. It was also the purpose to examine the concept of pain as the subjects were all believed to be suffering from chronic pain secondary to their industrial injury.

All the studies examined must be interpreted with caution. For example, the study by Rader and Haber (1984) has a small sample size (N=63) although they were randomly selected. There was no control group which detracts from this study. Little was said regarding the testing procedure involved.

In another study by Pilowsky and Bassett (1982), small sample size is again a problem. This is a comparative study, although the group of depressives contains only 53 subjects. It is not clear whether these subjects were randomly selected. The group of chronic pain subjects could have been suffering masked depression which would confound the results. Thus, the "purity" of the two groups is questionable.

In a good study by Pilowsky, et al (1977) there is a good sample size although a relatively small sample of men. The relationship between depression and chronic pain was the focus of the study. It would have been a stronger study if the reliability and validity of the test instruments was addressed. The Levine - Pilowsky depression questionnaire was used. A good statistical analysis was employed in the study.

In a small study by Ward, et al (1979) there is a shortage of subjects (N=16). No comparison group is employed which would have aided in determining efficacy of treatment; further work is needed to confirm the hypotheses. The group of moderate to

severe depressives with moderate anxiety must be compared with a group of moderate to severe depressives with low anxiety. It is difficult to generalize this study's findings to pain patients.

The study by Neilson and Williams (1980) is one of the best cited in the literature review. The sample size is adequate at 526 and a control group is used. The B.D.I. was used and was shown to be a sensitive screening test. A pilot study had been done.

In the study by Beals and Hickman (1972) an adequate sample size was used. In addition to the group comprised of industrially-injured workers, a control group of non-injured workers was utilized. Additional studies of the various factors influencing return to work following the injury are needed.

In short, all of the studies cited must be viewed and generalized with caution. The purpose was to view the link between depression and pain. Although the literature clearly establishes a relationship between pain and depression, the focus of this research design is on depression; no attempts were made to measure pain. That will be the focus of a follow-up study. The review of pain, then, serves as a backdrop for this study.

**Hypotheses**

A number of hypotheses were generated and these form the backbone of this study. There is a paucity of studies similar to this one and the hypotheses were therefore taken from clinical experience.

The following hypotheses were tested:

1. There is a difference on Beck Depression Inventory (B.D.I.) scores between males and females.
2. There is a relationship between B.D.I. scores and age.
3. There is a difference on B.D.I. scores between married, single and divorced subjects.
4. There is a relationship between B.D.I. scores and level of education.
5. There is a difference on B.D.I. scores between union and non-union members.
6. There is a relationship between B.D.I. scores and salary earned.
7. There is a difference on B.D.I. scores between those believing they had a job and those who believed they had no job to return to.
8. There is a relationship between B.D.I. scores and length of stay at the Centre.
9. There is a difference between B.D.I. scores and discharge status.
10. There is a relationship between B.D.I. scores and length of time between occurrence of accident and admission to the Centre.

# CHAPTER III

# METHODOLOGY

In order to determine the impact or relationships of depression on the rehabilitation of industrially-injured adults, a study was designed and conducted to test the hypotheses.

## Sample and Population

The statistics for actual patients at the Centre in 1984 were examined; in total 2088 patients were admitted. The sample was stratified to give the same representation in the sample as occurred for the year 1984 for the Centre as a whole. This resulted in 10 subjects being selected from Psychology Department caseloads; 25 from Vocational Rehabilitation Department caseloads, and 20 from workers who did not receive assistance from either area.

Fifty-five male and female patients were selected from the population of injured workers at the Workers' Compensation Board Rehabilitation Centre in Edmonton. All complained of chronic pain, which was most frequently related to back problems. Patients were chosen from three areas to form a stratified sample:

1. Those receiving counselling from a psychologist;
2. Those receiving vocational assistance and counselling from a vocational rehabilitation counsellor;
3. Those not receiving assistance.

The 10 patients selected from the Psychology Department were randomly selected by psychologists from their caseloads. The 20 patients who were not referred were selected randomly as they were admitted to the Rehabilitation Centre. The 25 patients who had vocational rehabilitation counsellors were selected in the same manner as those referred to psychologists.

All subjects were administered the Beck Depression Inventory (B.D.I.) short form (Appendix 3). A demographic data sheet (Appendix 2) was completed on each subject.

**PROCEDURE**

The subjects were advised of the nature of the study and requested to sign a consent form. (Appendix 1). Subjects were assured that confidentiality would be adhered to and they would remain anonymous in the study. They were interviewed to obtain basic demographic features as contained in the questionnaire.

It should be noted that the headings for each of the 13 categories on the Beck Depression Inventory were erased as it was felt that these headings would bias the results of the particular population. This is especially true of the item entitled "Work Difficulty" which was felt to be an inappropriate heading for this sample, and likely to create confusion.

The males and females were combined into one group. As subsequent testing revealed no signficant difference between males and females for depression, this procedure was justified.

Statistical procedures used for hypotheses 2,4,6,8 and 10 were Pearson product-moment correlations. Since the numbers are generally interval or ratio (Ferguson, 1981), the Pearson product-moment correlation was used to investigate the strength of relationships. Scores on B.D.I. will be correlated with age, level of education, salary, length of stay at the Centre, and length of time between occurrence of accident and admission to the Centre. It was decided to use correlation coefficients in contrast to other tests so information would not be lost by arbitrarily classifying the data into groups. The concern was with the magnitude of concomitant variation (Ferguson, 1981).

For hypotheses 1 and 5, t tests were employed. This was to determine whether or not a difference existed between two independent groups. In this study, the variables were sex and union affiliation. Ferguson (1981) notes that the t test should be used only when there is reason to believe that the population distributions do not depart too grossly from the normal form and the population variances do not differ markedly from equality. This statistical procedure is said to be robust (Ferguson, 1981).

Hypotheses 3, 7 and 9 underwent analysis of variance procedures. The significance of the difference among data for three independent groups (when the data are of the interval or ratio type) involves the one-way Anova as the appropriate test. Marital status, belief in job, and discharge status were the variables subjected to the Anova procedure.

For all hypotheses, .05 was the accepted confidence level.

**Instrumentation**

The Beck Depression Inventory, short form (B.D.I.) was used in this study (see Appendix 3). The B.D.I. is a self administered thirteen item questionnaire with a choice of four answers for each item. Scores range from 0 to 39:

0-4 none or minimal depression;

5-7 mild depression;

8-15 moderate depression;

16+ severe depression.

The Beck Depression Inventory short form is a highly reliable and valid measurement relative to other measures of depression (Williams & Barlow, in press). Metcalfe and Goldman (1965) found this inventory a satisfactory and reliable method of assessing depressive illness. They claim that it has the advantage of being very easily answered, of not requiring much time on the part of skilled personnel, and of being independent of doctor and nurse biases. It is usually completed by the subject within 10 minutes and can be scored in 1 minute. "In the great majority of occasions the test will effectively reflect the patient's depth of depression (Metcalfe & Goldman 1965 p. 240)".

The B.D.I. has a mean of 9.65 and a standard deviation of 6.51. Comparing the Hamilton Rating Scale (HRS)for depression with the B.D.I. resulted in the following: Spearman rank correlation co-efficient to compare the patient's total scores on the B.D.I. and H.R.S. showed a high correlation (r=.75). (Schwab, Bialow & Holzer, 1966, p. 96). The internal consistency within the

Beck Scale is shown by correlation coefficients which range from .322 to .616 between the items and the total scores. The cutting score established by Beck was 13. The B.D.I. had several categories referring to pessimism, failure and self-punitive wishes. The suicide item on the H.R.S. correlated with 5 items on the B.D.I.(Schwab, Bialow & Holzer, 1966). Both scales have value for assessing depression in medical in-patients. They do not duplicate each other due to differences in methodology and measure somewhat different components of the depressive complex (Schwab, et al, 1966).

In a study by Nussbaum (1971) inter-correlations among variables were obtained. Initially, the product-moment correlation between the clinical rating of global depression and the B.D.I. was .66, which increased to .73 at the end of treatment. The correlation between the changed scores of these measures was .67. Considering the type of devices involved and the restricted range of the sample, the extent of these correlations appears to indicate that similar underlying dimensions are being tapped by both instruments (p. 113). The initial and final correlations between these two measures and the MMPI showed depression at .75 and the B.D.I. at .69.

Studies of the internal consistency and stability of the instrument indicate a high degree of reliability. The Pearson r between the odd and even categories was computed and yielded a reliability coefficient of .86. (Beck, Ward, Mendelson, Mock, & Erbaugh, 1960) Comparisons between the scores on the inventory

and clinical judgements by the diagnosticians indicate a high degree of validity. A Pearson biserial correlation coefficient was calculated at .65 ($p < .01$) for a sample size of 226. In another study by the same authors, a correlation of $r = .67$ ($N=183$, $p < .01$) was found (Cited in Beck et al, 1960, p. 58).

Beck further noted that the inventory was able to discriminate effectively among groups of patients with varying degrees of depression. It also was able to reflect changes in the intensity of depression after an interval of time. "In view of these attributes of reliability and validity, this instrument is presented as a useful tool for research study of depression, and as a step in the direction of placing psychiatric diagnosis on a quantitative basis (Beck, et al, 1960, p. 61)."

Therefore, it was appropriate to select the B.D.I. for this study: it is reliable and valid, and all subjects completed it with relative ease. The intellectual sophistication of this sample necessitated such an instrument. The study afforded a view of depression as an affective response measured by the B.D.I.

## CHAPTER IV

## RESULTS

Following data collection, the results were subjected to five tests of significance, and one correlation matrix.

Table 1 presents the ages of the sample. The distribution is 20% female and 80% male. The actual gender distribution for the year 1984 at the Centre was: 89.9% males; 10.1% females. The majority of industrial accidents involve men.

Table 2 represents numbers of days from date of accident to admission to the Centre. Not all accident victims get referred to the Centre; only those requiring intensive therapy, conditioning and other modalities would get referred by the attending physician. The waiting list for admission accounts for some of the time lag although physicians often first attempt local resources.

Tables 3 to 7 present additional descriptive results from the sample's demographic data. Table 3 reveals that the majority of participants were married. Table 4 indicates a relatively low level of formal education; all were literate. Table 5 indicates the majority of the sample belonged to a union. Table 6 reveals the hourly wages of the sample. Table 7 reveals the fact that the majority of the sample went through treatment with the belief that no job would be available for them on completion of treatment. Only 22% believed jobs were unconditionally secure. Table 8 shows that the average length of time spent at the Rehabilitation Centre was 64.4 days.

TABLE 1

AGE OF THE SAMPLE

| | |
|---|---|
| Mean | 36.27 |
| Std. dev | 10.54 |
| Min age | 19 |
| Max age | 57 |
| Total Cases | 55 |

(N=55)

TABLE 2

NO. OF DAYS FROM ACCIDENT TO CENTRE ADMISSION

| | |
|---|---|
| Mean | 281.7 |
| Std Dev | 197.6 |
| Min | 20 |
| Max | 1000 |

(N=55)

TABLE 3

MARITAL STATUS OF SAMPLE

| STATUS | FREQUENCY | % |
|---|---|---|
| Single | 11 | 20 |
| Married | 39 | 70.9 |
| Divorced | 5 | 9.1 |

(N=55)

TABLE 4

EDUCATION OF SAMPLE

| | Years |
|---|---|
| Mean | 9.8 |
| Std Dev | 2.6 |
| Min | 0 |
| Max | 16 |

(N=55)

TABLE 5

UNION AFFILIATION OF SAMPLE

| | |
|---|---|
| Union Members | 63.6% |
| Non Union | 36.4% |

(N=55)

TABLE 6

HOURLY SALARY OF SAMPLE

| | |
|---|---|
| Mean | $12.45 |
| Std Dev | 3.90 |
| Min | 5.00 |
| Max | 25.00 |

(N=55)

TABLE 7

PROPORTION OF SAMPLES THAT BELIEVED THEY HAD NO JOB TO RETURN TO, JOB TO RETURN TO, OR JOB IF THEY COULD HANDLE IT PHYSICALLY

| Belief | Proportion |
|---|---|
| No job to return to | 58% |
| Job to return to | 22% |
| Conditional: job would only be available if they could physically handle it. | 20% |

(N=55)

TABLE 8

NO. OF DAYS SAMPLE SPENT IN REHAB. CENTRE

| | |
|---|---|
| Mean | 64.4 |
| Std Dev | 33.4 |
| Min | 1 |
| Max | 140 |

(N=55)

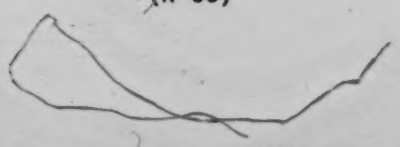

TABLE 9

PERCENTAGE OF SAMPLE DISCHARGED FROM CENTRE

FIT FOR REGULAR WORK, MODIFIED WORK OR UNFIT

| | |
|---|---|
| Considered fit for regular work: | 5.5% |
| Considered fit for modified work: | 50.9% |
| Unfit for work, benefits continue: | 43.6% |

(N=55)

Table 9 shows the discharge status of the sample. Modified duties would include work restrictions such as no heavy lifting of a repetitive nature, no working above shoulder level, no walking over uneven terrain and so on. If a worker was considered unfit for work, his disability benefits would continue and he would return to his physician for further medical investigation.

The following hypotheses were tested: in every instance the dependent variable was the subjects' B.D.I. score (see Appendix 4 for subjects raw B.D.I. scores).

Hypothesis one stated there would be a difference on B.D.I. score between males and females. The t test for independent groups (df=53) revealed an unpaired t value of 1.64 which was not statistically significant. Therefore the hypothesis was not supported.

Hypothesis two stated there would be a relationship between B.D.I. score and age. The Pearson product-moment correlation coefficient (df=54) was .03 which was not statistically significant. Therefore, this hypothesis was not supported (see table 14).

Hypothesis three stated there would be a difference on B.D.I. score between married, single, and divorced subjects. A one-way Anova (table 10) did not indicate a significant difference among the means analyzed according to marital status.

Hypothesis four stated there would be a relationship between B.D.I. score and level of education. The Pearson product-moment correlation coefficient (df=54) was -.03 and was not statistically significant; therefore, this hypothesis was not supported (see table 14).

Hypothesis five stated there would be a difference on B.D.I. scores between union and non-union members. The t test for independent groups (df=53) revealed an unpaired t value of .32 which was not statistically significant. Therefore, this hypothesis was not supported.

Hypothesis six stated there would be a relationship between B.D.I. scores and salary. The Pearson product-moment correlation coefficient (df=54) was -.19 and was not statistically significant. This hypothesis was not supported (see Table 14).

Hypothesis seven stated there would be a difference on B.D.I. score between those believing they had a job, those who believed they had no job, and those who believed they had a job if they could physically handle it (conditional). A one-way Anova (Table 11) did not indicate a significant difference among the means analyzed according to the belief of whether or not they had a job to return to. Consequently, this hypothesis was not supported.

Hypothesis eight stated there would be a relationship between B.D.I. score and length of stay at the Centre. The Pearson product-moment correlation coefficient (df=54) was -.16 and was not statistically significant. Consequently, this hypothesis was not supported (see Table 14).

Hypothesis nine stated there would be a difference on B.D.I. score according to discharge status. A one-way Anova (Table 12) indicated a significant difference among the means analyzed according to discharge status. A Scheffe test (Table 13) was employed to determine where the differences among the groups were. Group 1 (disabled) was significantly different from group 2 (fit for modified employment) ($p < .05$).

Hypothesis ten stated there would be a relationship between B.D.I. score and length of time between occurrence of accident and admission to the Centre. The Pearson product-moment correlation

coefficient (df=54) was .27 which was statistically significant ($p < .05$). The longer the wait to get into the Centre, the higher the degree of depression (see Table 14).

Supplementary analyses resulted in interesting findings although none of these were hypothesized. There was a significant difference between mean hourly wage by sex with males having a mean hourly wage of $13.19 and females $9.48. The t test for independent groups (df=53) revealed an unpaired value of 3.03 ($p < .005$). Also, there was a significant difference in number of days between union and non-union members. Non-union members spent an average of 58 days in the Centre while union members spent an average of 76 days. The t test for independent groups (df=53) showed an unpaired t value of 1.95 ($p < .05$). Union wage (mean $14.29) was significantly greater than non-union wage (mean $11.40). The t test for independent groups (df=53) revealed an unpaired t value of 2.81 which was statistically significant ($p < .005$).

**TABLE 10**

**ONE-WAY ANOVA 3 GROUPS**

**MARITAL STATUS (MARRIED, SINGLE, DIVORCED) AND B.D.I. SCORE**

| Source | DF | Sum Squares | Mean Square | F-Test |
|---|---|---|---|---|
| Between Groups | 2 | 31.5077 | 135.796 | .4529 |
| Within Groups | 52 | 1808.6741 | 30.16 | p<.638 |
| Total | 54 | 1840.1818 | | |

| Group | Count | Mean |
|---|---|---|
| BDI: single | 11 | 5.73 |
| BDI: married | 39 | 7.46 |
| BDI: divorced | 5 | 8.20 |

(N=55)

**TABLE 11**

**ONE-WAY ANOVA THREE GROUPS**

**JOB STATUS (BELIEF HE HAD A JOB, HE DOES NOT HAVE A JOB, HE DOES IF HE CAN PHYSICALLY HAND IT) AND B.D.I. SCORE**

| Source | DF | Sum Squares | Mean Squares | F-Test |
|---|---|---|---|---|
| Between Groups | 2 | 23.864 | 11.932 | .3416 |
| Within Groups | 52 | 1816.317 | 34.929 | p<.712 |
| Total | 54 | 1840.182 | | |

| Group | Count | Mean |
|---|---|---|
| BDI: no job | 32 | 7.72 |
| BDI: has a job | 12 | 6.17 |
| BDI: conditional | 11 | 6.73 |

(N=55)

**TABLE 12**

**ONE WAY ANOVA 3 GROUPS**

**DISCHARGE CATEGORY (FIT FOR REGULAR WORK, FIT FOR MODIFIED WORK, DISABLED) AND B.D.I. SCORE**

| Source | DF | Sum Squares | Mean Square | F-Test |
|---|---|---|---|---|
| Between Groups | 2 | 271.593 | 135.796 | 4.502 |
| Within Groups | 52 | 1568.589 | 30.165 | p< .0157 |
| Total | 54 | 1840.182 | | |

| Group | Count | Mean |
|---|---|---|
| BDI fit for regular work | 3 | 3 |
| BDI fit for modified work | 28 | 5.54 |
| BDI Disabled after treatment | 24 | 9.63 |

(N=55)

TABLE 13

SCHEFFE PROCEDURE TO DETERMINE SIGNIFICANT DIFFERENCES AMONG THE THREE DISCHARGE CATEGORIES OF THE SAMPLE: FIT FOR REGULAR WORK, FIT FOR MODIFIED WORK, DISABLED.

| | | Group 3 Fit for regular | Group 2 Fit for modified | Group 1 Totally disabled |
|---|---|---|---|---|
| Mean | Group | | | |
| 3.000 | Group 3 | | | |
| 5.5357 | Group 2 | N.S. | | |
| 9.6250 | Group 1 | N.S. | .05 | |

(N=55)

TABLE 14

CORRELATION COEFFICIENTS FOR THE VARIABLES B.D.I. SCORE, AGE, EDUCATION LEVEL, SALARY, NO. OF DAYS IN CENTRE, DAYS FROM ACCIDENT TO CENTRE

| | AGE | EDUC | SALARY | # DAYS IN CENTRE | DAYS FROM ACCIDENT TO CENTRE |
|---|---|---|---|---|---|
| BDI | .03 | -.03 | -.19* | -.16 | .27** |
| AGE | - | -.48*** | .23** | -.05 | .12 |
| EDUC | | - | -.11 | -.14 | -.47*** |
| SALARY | | | - | .13 | .04 |
| # DAYS IN CENTRE | | | | - | .04 |
| DAYS FROM ACCIDENT TO REHAB. CENTRE | | | | | - |

(N=55)

* $p < .10$
** $p < .05$
*** $p < .01$

## CHAPTER V

## DISCUSSION, LIMITATIONS, IMPLICATIONS

Ten hypotheses were tested (see Chapter IV). The following were found to be statistically significant: there was a difference on BDI scores according to discharge status. There was a difference on BDI scores and length of tiem between occurrence of accident and admission to the Centre.

The hypothesis indicated that there would be a difference on BDI score according to discharge status. The one-way Anova (Table 12) revealed a significant difference among the means. The groups were based on discharge status: totally disabled; fit for modified work; fit for full work. A post hoc pair wise comparison test revealed that the only significant difference was found between the totally disabled group and fit for modified work group. None of the others emerged as significantly different. A conservative post hoc test was employed because the group fit for full work was comprised of only 3 subjects. The majority of workers discharged from the Centre have employment limitations. There was a significant difference in the two major groups in terms of level of depression. Those discharged as totally disabled are often disheartened by their apparent lack of progress while in the Centre. Their futures often appear bleak and are full of uncertainties. This may account for why they are more depressed than the workers who are discharged fit for modified employment. This latter group may have some optimism regarding the future

especially in that they are now ready to return to some form of productive activity.

The final hypothesis that proved acceptable was that there would be a difference on BDI score and length of time between occurrence of accident and admission to the Centre. In short, the longer the period between date of accident and date of admission, the greater the degree of depression. It was felt that the longer someone had to wait to gain admission, the more time he had to dwell on his somatic concerns. A high degree of inactivity for this period could account for restlessness, apathy ("nothing is being done") and boredom, all of which are intertwined with depression. The previously active person would now be at home, explaining the increase in domestic unrest, marital instability, and fears of the future (anticipatory anxiety). The time would allow for extensive ruminating, an earmark of depression. Furthermore, several studies (Beals and Hickman, 1972; Phillips, 1964) have found a relationship between severity of emotional distress and time elapsed since injury.

The majority of the hypotheses generated were found to have no statistical significance. Hypothesis one stated there would be a difference on BDI scores between males and females. No difference was found; perhaps if there were more females in the sample a difference would have been found. Perhaps the fact that women work often to supplement the primary breadwinner and therefore there is less pressure on women could explain the lack of findings on this hypothesis. This was not examined further but cannot be ignored.

There was no significant difference in BDI scores according to marital status. There was no significant relationship between BDI scores and level of education. An increase in education does not provide resources to prevent depression. There was no significant difference on BDI scores between union and non-union membership. It was felt that union affiliation provided a sense of unity and solidarity, important factors in dealing with fears of the future, questions of uncertainty, and other fears common to depressed workers; however, this was not supported.

There was no significant difference on BDI scores between those believing they had a job and those who thought they had no job to return to. This was surprising as it was felt that job security would be an important component in determining level of depression. Loss of job was thought to be a factor in enhancing the depression; conversely, knowledge of job security was thought to be a factor providing some immunity to depression. This should be investigated further.

There was no significant relationship between BDI score and length of stay at the Centre. This is surprising as it was felt that the longer one stays at the Centre, the more depressed one would become due to lack of progress. However, it may be that the Centre provided a sense of security for some and support groups for people.

These are just speculations on why these hypotheses were not supported. The literature did not assist in the formulation of the hypotheses and therefore, does not provide explanations concerning the lack of findings.

**Limitations and Implications**

Some of the lack of findings could be due to methodological problems such as small sample size and type II errors. This has important implications for future studies. Future researchers on this topic may wish to include the MMPI to measure depression and other personality features. Although the BDI is considered a better instrument to measure depression, other personality correlates could be examined with the MMPI which would strengthen the study.

In addition, there was no control group which will be beneficial for future studies on this topic. There was no measure of pain although it is recognized as an important factor. Pain questionnaires would likely assist in this process.

The study has direct implications for the Centre. Attempts are now being made to reduce the waiting list. Psychology and psychiatry are taking a more active role in the rehabilitation of industrially-injured adults. Interdisciplinary teams are being developed with special attention being paid to depression. Some physicians automatically use the B.D.I. as part of the medical work-up. Counselling and medications are being utilized in the treatment of depression.

Another implication for the Workers' Compensation Board would be to introduce Vocational Rehabilitation Counsellors earlier in the rehabilitation of a worker. Workers need not sit idle while they wait to enter the Centre; vocational therapy may provide the necessary help to prevent or amelioriate depression. With the knowledge that something is being done, workers would be reassured about their futures. This could ease the anticpatory anxiety so often intertwined with depression. Some workers could even be encouraged to take evening or correspondence courses, thereby occupying their time with meaningful activity. Thus, vocational rehabilitation can be seen as a vehicle to help workers avoid becoming further depressed and thereby enhance the recovery process.

When viewing rehabilitation from the physical versus psychosocial approach, administrators would be wise to focus more on the latter approach. This is especially true of adjustment coping. This reaffirms the need for psychological support groups such as group therapy and stress management. Consideration must also be given to workers away from their homes attending the Centre. Women who have been away from their families or home towns are placed in frightening circumstances which tend to deepen their depression and prolong their recovery.

Further implications will become apparent as more studies are undertaken in this area. Hopefully, this study will serve as a springboard for future research on depression and rehabilitation.

# REFERENCES

## REFERENCES


Addison, R.G. (1984). Chronic pain syndrome. The American Journal of Medicine, 77 (3A), 54-8.

American Psychiatric Association (1980). Diagnostic and Statistical Manual of Mental Disorder (3rd Ed.), Spitzer R.L. (Chairperson), Washington, D.C.

Beals, R.K., & Hickman, W.W. (1972). Industrial injuries of the back and extremities. Journal of Bone & Joint Surgery, 54A, 1593-1611.

Beck, A.T. (1967). Depression. New York: Harper and Row.

Beck, A.T., Ward, G.H., Mendelson, M., Mock, J., & Erbaugh, J. (1960). An inventory for measuring depression. Archives of General Psychiatry, 4, 53-63.

Beck, A.T., & Beck, R.W. (1972). Screening depressed patients in family practise: A rapid technique. Postgraduate Medicine, 52(6), 81-5.

Burns, D., & Beck, A.T. (1971). Cognitive therapy of depression: A treatment manual, New York: Guilford Press.

Bradley, J.J. (1963). Severe localized pain associated with the depressive syndrome. British J. Psychiatry, 109(11), 741-7.

Brena, S.F., & Chapman, S.L. (1981). Learned pain syndrome. Postgraduate Medicine, 69, (11), 53-61.

Clark, D.W. & Sparks, J. A. (1981). Social, Psychological and medical aspects of chronic pain. Rehabilitation Counseling Bulletin, 24, 292-8.

Dahlstrom, W.G., Welsh, G.S., & Dahlstrom, L.E. (1972). An MMPI Handbook: Clinical Interpretation, Minneapolis, MN: University of Minnesota Press.

Davis, J. (1970). Theories of biological etiology of affective disorders. International Review of Neurobiology, 12, 145-175.

Elton, D., Stanley, G.V., & Burrows, G.D. (1978). Self esteem and chronic pain. Journal Psychosomatic Research, 22,25-30.

Enelow, A.J. (1968). Industrial injuries: Prediction and prevention of psychological complications. Journal of Occupational Medicine, 10,683-7.

Ferguson, G.A. (1981). Statistical Analysis in Psychology and Education (5th Ed.), New York: McGraw-Hill Book Company.

Finneson, B.E. (1973). Low Back Pain. Philadelphia, Pa.: J.B. Lippincott.

Fordyce, W.E. (1976). Behaviour Methods for Chronic Pain and Illness, St. Louis: C.V. Mosby.

Freidman, R.J. (1974). The psychology of depression: an overview. In R.J. Friedman (Ed.), The Psychology of Depression: Contemporary theory and Research, New York: John Wiley and Sons.

Freud, S. (1968). Mourning and Melancholia. In W. Gaylin (Ed.), The Meaning of Despair. New York: Science House.

Goldberg, R.T. (1982). The social and vocational rehabilitation of persons with chronic pain: A critical evaluation. Rehabilitation Literature, 43,274-283.

Gottlieb, H.V. (1979). An innovative program for the restoration of patients with chronic back pain. Physical Therapy, 59, 996-99.

Harding, K.B. (1984). Workers' Compensation in Canada: Past, Present and Future, Unpublished Address to the Petroleum Industry's Annual Safety Seminar, Banff, Alberta.

Hare, M. (1985). The physical problems of depressive illness. Physiotherapy, 71, 258-261.

Harsha, W.N. (1982). Pain is not a disability. Journal of Oklahoma State Medical Association, 75, 335-338.

Hendler, N., Vierstein, M., & Shallenberger, C. (1981). Group therapy with chronic pain paitent. Psychosomatics, 22(4), 333-40.

Hirschfield, A.H., & Behan, R.C. (1963). The accident process: Etiological considerations of industrial injuries. Journal of American Medical Association, 186, 193-199.

Hurst, L.A. (1969). Research implications in converging advances in psychiatric genetics and the pharmacology of psychotropic drugs. In M. Manosevitz, G. Lindzey, and D.D. Theissen (Eds), Behavioral Genetics: Method and Research, New York: Appelton - Century Crafts.

Izard, C.E. (1972). Patterns of Emotions: A New Analysis of Anxiety and Depression, New York: Academic Press.

Jacobs, R. (1983). Psychological aspects of chronic pain. Journal of the National Medical Association, 75, (4), 387-391.

Kaplan, H.I. & Sadock, B.J. (1985). Modern Synopsis of Comprehensive Textbook of Psychiatry (4th Ed.) London: Williams & Wilkins.

Kathol, R.G. (1985). Depression associated with physical disease. In Beckham, E.E. & Leber, W.R. (Eds.) Handbook of Depression: Treatment, Assessment and Research, Homewood, Ill; Dorsey Press.

Kielholz, P. (1972). Depressive illness: diagnosis, assessment, treatment, Baltimore: Williams & Wilkins.

Klerman, G.L. (1971). Clinical research in depression. Archives of General Psychiatry, 24, 305-313.

Klerman, G.L. (1978). Affective disorders. In A.M. Nicholi , (Ed.), The Harvard guide to modern psychiatry, Cambridge, MA: Belknap Press/Harvard University Press.

Kline, N.S. (1967). Psychopharmacologic drugs. Postgraduate Medicine, 42, 268-274.

Kovacs, M., &Beck, A.T., (1978). Maladaptive cognitive structures in depression. American Journal of Psychiatry, 135 (95), 525-33.

Kraines, S.H. (1957). Mental Depressions and their Treatment. New York: MacMillan.

Lambert, V., & Lambert, C. (1979). The Impact of Physical Illness and Related Mental Health Concepts, Prentice Hall: Englewood Cliffs.

Lawlis, G.F. & McCoy, C.E. (1983). Psychological evaluation: patients with chronic pain. Orthopedic Clinics of North America, 14, 527-538.

Leff, M.J., Roatch, J.R. & Bunrey, W.E. (1970). Environmental factors preceding the onset of severe depression. Psychiatry. 33,293-301.

Loeser, J.D., & Black, R.G. (1975). Taxonomy of Pain, 1,81-84.

Lopez, J.J. (1972). Masked Depression. British Journal of Psychiatry, 120 (3), 245-58.

Magni, G., & de Bertolini, C. (1982). Treatment of perineal neuralgia with anti-depressants. Journal of Royal Society of Medicine, 75, 214-5.

Magni, G., & de Bertolini, C. (1983). Chronic pain as a depressive equivalent. Postgraduate Medicine, 73(3), 79-85.

Maurice-Williams, R.S. (1981). Spinal Degenerative Disease, Bristol: John Wright and Sons Ltd.

Metcalfe, M., & Goldman, E. (1965). Validation of an inventory for measuring depression. British Journal of Psychiatry, 111, 240-242.

Moos, R. (1977). Coping with Physical Illness, Plenum Books: New York.

Morris, G.G. (1982). Psychology: An Introduction (4th edition), Prentice Hall, New Jersey.

Neilson, A.C., & Williams, T.A. (1980). Depression in ambulatory medicine patients: prevalence by self-report questionaire and recognition by non-psychiatric physicians. Archives of General Psychiatry, 37, 999-1004.

Nussbaum, K. (1971). Psychiatry assessment from documentary evidence. Comprehensive Psychiatry, 12, 89-131.

Paykel, E.S., Myers, J.K., Dienelt, M.N., Klerman, G.C., Lindenthal, J.J. & Pepper, M.P. (1969). Life events and depression: A controlled study. Archives of General Psychiatry, 21, 753-760.

Phillips, E.L. (1964). Some psychological characteristics associated with orthopedic complaints. Current Practise of Orthopedic Surgery, 2, 165-176.

Pilowsky, I. & Bassett, D.L. (1982). Pain and depression. British Journal of Psychiatry, 141, 30-36.

Pilowsky, I., Chapman, C.R., & Bonica. J.J. (1977). Pain, depression and illness behavior in a pain clinic population. Pain, 4,183-92.

Rader, C.M., & Haber, P.B., (1984). Psychological Profile of Industrially Injured Workers. Occupational Health Nursing, 8, 577-580.

Rodin, G. & Voshart, K. (1986). Depression in the medically ill: An overview. American Journal of Psychiatry, 143, 696-705.

Rutter, B.M. (1977). Some psychological concomitants of chronic bronchitis. Psychological Medicine, 7, 459-464.

Sacco, W.P., & Beck, A.T. (1985). Cognitive therapy of depression. In Beckham, E.E. & Leber, W.R. (Eds.). Handbook of Depression: Treatment, Assessment and Research, Homewood, Ill.: Dorsey Press.

Schaffer, C.B., Donion, P.T., & Bittle, R.M. (1980). Chronic pain and depression: a clinical and family history survery. American Journal of Psychiatry, 137, 118-120.

Schmale, A.H. (1972). Depression as affect, character style, and symptom formation. Psychoanalysis and Contemporary Science, 1, 154-158.

Schwab, J.J., Bialow, M., & Holzer, C.E. (1966). A comparison of two rating scales for depression. Psychosomatics, 6, 94-96.

Schwab, J.J., Bialow, M., Holzer, C.E., Brown, J.M., & Stevenson, B.E. (1967). Sociocultural aspects of depression in medical impatients. Archives of General Psychiatry, 17, 533-41.

Sederer, L. (ed) (1983). Impatient Psychiatry: Diagnosis and Treatment, London: Williams and Wilkins.

Sternbach, R.A. (1974). Pain Patients: Traits and Treatment, New York: Academic Press.

Strain, J. (1978). Psychological Intervention in Medical Practice, New York: Appleton Century Crafts.

Tullis, W.H., & Derebery, V.J. (1983). Delayed recovery in the patient with a work compensable injury. Journal of Occupational Medicine, 25, 829-835.

Ward, N.G., Bloom, V.L., & Fridel, R.O. (1973). The effectiveness of tricyclic anti-depressants in the treatment of coexisting pain and depression. Pain, 7,331-41.

Webb, L., Diclemente, C., Johnstone, E., Sanders, J., & Perley, R., (1981). DSM III Training Guide, New York: Brunner, Mazel.

Weddington, W.W. (1983). Longitudinal Management of Chronic Pain. Comprehensive Therapy. 9(6), 14-20.

Williams, J.G., & Barlow, D.H. (in press). Behavioural measurement of severe depression. Archives of General Psychiatry,

Yu, T., Lewis, R.H., & Wise, R.A.(1984). Low back pain in industry: An old problem revised. Journal of Occupational Medicine, 26(7), 517-524.

# APPENDICES

## APPENDIX 1

## CONSENT FORM

I, _____ consent and agree to participate in a research project on depression conducted by L. Block for his Master's Thesis at the University of Alberta. I understand that I will be guaranteed anonymity in this study.

I agree to complete a health inventory.

_____
Signature

## APPENDIX 2 - DEMOGRAPHIC DATA SHEET
## QUESTIONNAIRE

1. Name_____ Sex _____ Claim Number _____
2. Age___Date of Accident_____Date of Admission to Centre_____
3. Country of Birth _____
4. Marital Status _____
5. Number of Children (and ages) _____
6. Grade last completed at school _____
7. Occupation at time of injury _____
8. Union or non-union: Pre-accident_____Post-accident_____
9. Salary at time of accident: $_____
10. Do you have a Rehab. Counsellor?_____Psychologist?_____
11. Type of injury (diagnosis) _____
12. Do you think you have a job to return to? _____
13. Date fit for work: _____

**Discharge**

1. Number of days in Rehab. Centre _____
2. Disability of category at time of discharge (FFW, FMW, FLW = fit for regular duties or fit for modified duties as per physician, work officer and therapist): _____
3. Extent of injury at time of discharge (based on physician, work officer and therapist):

   i) **Excellent Results.** Subject no longer had pain. There working ability and routine physical activity were not restricted.

   ii) **Good Results.** Subject no longer complained of pain but had some residual stiffness or discomfort periodically, for which there was no need for specific treatment. Their working ability was not restricted.

   iii) **Moderate Results.** Subject felt significant improvement in pain but had to take medication, etc. Their working ability was restricted.

   iv) **Poor Results.** Either no decrease in pain occurred or the decrease was unstable. Their working ability seriously restricted.

Name_____ Date_____

# INSTRUCTIONS

On this questionnaire are groups of statements. Please read the entire group of statements of each category. Then pick out the one statement in that group which best describes the way you feel today, that is, *right now!* Circle the number beside the statement you have chosen. If several statements in the group seem to apply equally well, circle each one.

**Be sure to read all the statements in each group before making your choice.**

A. (Sadness)
- 3 I am so sad or unhappy that I can't stand it.
- 2 I am blue or sad all the time and I can't snap out of it.
- 1 I feel sad or blue.
- 0 I do not feel sad.

B. (Pessimism)
- 3 I feel that the future is hopeless and that things cannot improve.
- 2 I feel I have nothing to look forward to.
- 1 I feel discouraged about the future.
- 0 I am not particularly pessimistic or discouraged about the future.

C. (Sense of Failure)
- 3 I feel I am a complete failure as a person (parent, husband, wife).
- 2 As I look back on my life, all I can see is a lot of failures.
- 1 I feel I have failed more than the average person.
- 0 I do not feel like a failure.

D. (Dissatisfaction)
- 3 I am dissatisfied with everything.
- 2 I don't get satisfaction out of anything anymore.
- 1 I don't enjoy things the way I used to.
- 0 I am not particularly dissatisfied.

E. (Guilt)
- 3 I feel as though I am very bad or worthless.
- 2 I feel quite guilty.
- 1 I feel bad or unworthy a good part of the time.
- 0 I don't feel particularly guilty.

F. (Self-Dislike)
- 3 I hate myself.
- 2 I am disgusted with myself.
- 1 I am disappointed in myself.
- 0 I don't feel disappointed in myself.

G. (Self-Harm)
- 3 I would kill myself if I had the chance.
- 2 I have definite plans about committing suicide.
- 1 I feel I would be better off dead.
- 0 I don't have any thoughts of harming myself.

H. (Social Withdrawal)
- 3 I have lost all of my interest in other people and don't care about them at all.
- 2 I have lost most of my interest in other people and have little feeling for them.
- 1 I am less interested in other people than I used to be.
- 0 I have not lost interest in other people.

I. (Indecisiveness)
- 3 I can't make any decisions at all anymore.
- 2 I have great difficulty in making decisions.
- 1 I try to put off making decisions.
- 0 I make decisions about as well as ever.

J. (Self-Image Change)
- 3 I feel that I am ugly or repulsive-looking.
- 2 I feel that there are permanent changes in my appearance and they make me look unattractive.
- 1 I am worried that I am looking old or unattractive.
- 0 I don't feel that I look any worse than I used to.

K. (Work Difficulty)
- 3 I can't do any work at all.
- 2 I have to push myself very hard to do anything.
- 1 It takes extra effort to get started at doing something.
- 0 I can work about as well as before.

L. (Fatigability)
- 3 I get too tired to do anything.
- 2 I get tired from doing anything.
- 1 I get tired more easily than I used to.
- 0 I don't get any more tired than usual.

M. (Anorexia)
- 3 I have no appetite at all anymore.
- 2 My appetite is much worse now.
- 1 My appetite is not as good as it used to be.
- 0 My appetite is no worse than usual.

8-74-ELVP-4-CA-145-M (MC-882)

## APPENDIX 4

## DISTRIBUTION OF BDI SCORES

| VALUE | FREQUENCY | PERCENT |
|---|---|---|
| 0 | 4 | 7.3 |
| 1 | 3 | 5.5 |
| 2 | 3 | 5.5 |
| 3 | 6 | 10.9 |
| 4 | 7 | 12.7 |
| 5 | 4 | 7.3 |
| 6 | 3 | 5.5 |
| 7 | 3 | 5.5 |
| 8 | 4 | 7.3 |
| 9 | 4 | 7.3 |
| 10 | 2 | 3.6 |
| 11 | 1 | 1.8 |
| 12 | 3 | 5.5 |
| 14 | 2 | 3.6 |
| 15 | 2 | 3.6 |
| 19 | 1 | 1.8 |
| 20 | 1 | 1.8 |
| 23 | 1 | 1.8 |
| 26 | 1 | 1.8 |
| Total | 55 | 100% |